

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



*Mr. G. J. G. J.*

UNITED STATES DEPARTMENT OF AGRICULTURE  
Bureau of Agricultural Engineering

S. H. McCrory, Chief

MONTHLY NEWS LETTER

---

Vol. 1

October, 1931

No. 4

---

Mr. McCrory left October 5, to join other members of the soil erosion control committee in an inspection trip over the various erosion experiment farms. In addition to Mr. McCrory the committee consisted of J. G. Lipman, Director of the New Jersey Experiment Station, A. B. Conner, Director of the Texas Experiment Station and A. G. McCall, Chief of Soil Investigations, Bureau of Chemistry and Soils. The Committee spent about one day on each farm completing the inspection October 16, at Tyler, Texas.

Mr. McCrory will speak at the dedication of the agricultural engineering building, University of Kentucky, at Lexington, Kentucky, on October 28, on the subject "Contribution of Agricultural Engineering to Rural Life."

In his capacity as Chairman of the Chicago World's Fair committee of the A.S.A.E., Mr. McCrory has arranged with Williams and Wilkins to supervise the preparation of a booklet on agricultural Engineering. This booklet will be of a rather popular nature designed to inform the public as to what is agricultural engineering and the part it plays at present in agriculture. The booklet will consist of several chapters, each devoted to a particular phase of agricultural engineering and written by some one within the Society who is well informed on that particular phase. It will contain some 30,000 words.

Mr. McCrory is representing the Bureau on the Committee on Farm and Village Housing of the Presidents' Conference on Home Building and Home Ownership which is to be held in Washington on December 2 to 5. He is chairman of the special committee on Design and Construction of Farm and Village Houses. Geo. M. Warren, T.A.H. Miller, M. C. Botts and Wallace Ashby are cooperating with members of the special committee in the preparation of their report.

The following additions to the Bureau's personnel have been made within the past month:





Mr. E. M. Diffenbach, Assistant Mechanical Engineer, has been transferred from the Plant Quarantine and Control Administration. He has been stationed at Albany, Ga. to conduct investigations of spraying machinery.

Elmer E. Doolan, has been transferred from the Office of Information and placed in charge of mail and files.

F. C. Taylor, auditor, has been transferred from the Bureau of Public Roads.

R. C. Young, Principal Mechanic, has been transferred from the Bureau of Entomology and will assist Charles A. Bennett at Stoneville, Miss.

On Tuesday, October 13, Lewis A. Jones, in cooperation with the manufacturer, staged a demonstration of terracing with a "Caterpillar" Fifteen Tractor and Fifteen Grader on a field at the National Training School for Boys, on Bladensburg Road, District of Columbia. In the grader the manufacturer has embodied some of the suggestions developed by the Bureau in its research work on the construction of terraces. About 40 interested persons were present at the demonstration, including representatives from several bureaus of this Department. Those from our bureau besides L. A. Jones, were H.H. Barrows, G. A. Cumings, S. P. Lyle, J. R. McCalmont, R. D. Marsden, G. P. Wolf and B. M. Joyce.

In connection with service work for the Animal Husbandry Division of the Bureau of Animal Industry, T.A.H. Miller left October 19 for a trip to Big Spring, Texas to advise regarding the construction of a beef cattle feeding plant. From thence he will go to Spur, Texas to obtain information on cotton handling equipment for the range.

F. E. Staebner has prepared a short article on the irrigation of golf courses at the request of the United States Golf Association. It has been approved for publication in the journal of that Association.

Mr. Staebner has designed an experimental irrigation system for the Bureau of Dairy Industry for their livestock experiment station at New Iberia, La.

W. D. Ellison's headquarters have been transferred from Bowling Green, Ohio to Dover, Del. where he will take charge of a new project on the maintenance of drainage ditches in Kent County, in cooperation with the Delaware Highway Department. The last session of the Delaware legislature appropriated \$10,000 a year for two years to be expended in the maintenance of drainage ditches and the work is to be carried on under the direction of Mr. Ellison. Various methods of maintaining ditches will be tried out.





G. A. Mitchell is supervising the installation of a 36-inch turbine at the Menantico Colony near Vineland, N. J. to be used in developing electricity for use at the colony and in developing power for pumping water for about 12 acres of surface irrigation.

The following items, pertaining to the various soil erosion projects, have been submitted by C. E. Ramser.

R. A. Norton has completed all terrace construction work on the Page County, Iowa project, and has also finished the location survey of terraces preliminary to the preparation of a map showing the accurate location of all experiments on the farm. He has started the work of installing Parshall flumes and silt measuring apparatus with the expectation of completing this work before winter sets in.

On the Guthrie project H. S. Riesbol has finished the construction of a 3-foot reinforced concrete Parshall flume. This flume will measure the run-off from an area of about 35 acres of terraced land. In order to use a minimum throat width and still have capacity for maximum flows the flume was built for a water stage of 3 feet at the float well. This is one half foot higher than flumes tested by Mr. Parshall in the laboratory at Fort Collins and in accordance with recommendations from Mr. Parshall, the upper section was made 10 feet long instead of the standard length of 5 feet,  $4\frac{3}{4}$  inches. A bristol float recorder equipped with a pulley for three foot range in water stage has been installed at this flume where it is expected that tail water conditions will be such as to insure a free flow.

H. E. Bergschneider has completed the installation of three 1-foot Parshall flumes and silt samplers with 5 by 16 foot silt boxes on the State farm near Heavener, Okla. This apparatus is installed on terraces with variable grades of 0 to 4 inches and vertical spacings of 2,  $3\frac{1}{2}$  and 5 feet. The terraces are 700 feet long and are on a land slope of about 4 per cent.

An experiment is being conducted on the Hays project to determine the effect of subsoiling in level terrace channels having no outlets to determine the rate at which standing water is absorbed by the soil. A record of the crop yields will be kept to determine the effect of subsoiling in terrace channels upon crops. R. R. Drake reports that drilling of wheat has been started on the Hays project.

A. T. Holman reports a total of 5.1 inches of rainfall on the Bethany project during the week ending September 26. Two rains during this period of rather high intensity enabled the collection of considerable data on run-off and soil losses from the terraces and one pasture area.







P. C. McGrew is pushing the construction of silt boxes on the Pullman project in an effort to finish this work before winter. He reports that all terraces are now ready for the installation of storage tanks and divisor boxes and additional flumes that have been ordered. Four sizes of flumes 3-inch, 6-inch, 12-inch and 24-inch will be installed on the Pullman project requiring silt boxes of the following dimensions 2' x 16', 3' x 16', 5' x 16', and 8' x 16'. This is the only erosion project where flumes having throat widths as small as 3 inches and 6 inches are used owing to the fact that much of the run-off is produced by slow rains or melting snow.

H. O. Hill reports that ten bales of cotton have been picked on the Temple project and that there is likely two to four more bales in the field.

R. W. Baird has completed computations on run-off and silt losses for several rains that occurred since July 1, 1931. Outstanding among the results obtained is the fact that the variable graded terrace is far superior to the uniform graded terrace from the standpoint of soil losses. For a rain of 1.87 inches on August 19, 478 pounds of soil per acre were lost from a terrace with a uniform grade of 3 inches per 100 feet as compared with 71.5 pounds of soil per acre from a terrace with variable grade of from 0 to 3 inches. About 7 times as much soil was lost from the variable graded as from the uniform graded terrace. The length of both terraces was about 1,700 feet, the vertical spacing about 5 feet and the land slope about 7 per cent. Comparison of data obtained on a level terrace and a graded terrace of the same rain indicate that the level terrace is a much greater conservator of soil. Fourteen and seven tenths pounds of soil were lost from the level terrace as compared with 58.6 pounds from a terrace with a uniform grade of 3 inches per 100 feet, indicating that four times as much soil was lost from the variable graded terrace as from the level terrace. These terraces are 700 feet long, have a vertical spacing of about 4 feet and a land slope of about 6 per cent.

Fred C. Scobey, assisted by Arthur Kidder of the Pacific Gas and Electric Co., made tests on three long reaches of Tiger Creek Conduit of that Company, on the Mokelumne River, Calif. This structure is an extremely sinuous bench flume of reinforced concrete. Nearly 20 miles long, 14 feet wide, with water 6 feet deep, it ranks as one of the world's outstanding canals. The tests had several objects in view, including studies of the influence of excessive curvature on the capacity elements; the super-elevation of water on the outside of the curves and depression on the inside; and the distribution of velocities at extreme bends. Since part of this work duplicated laboratory experiments conducted by D. L. Yarnell at Iowa City, on a large scale, he participated in

The first part of the paper discusses the importance of the study and the objectives of the research. It then proceeds to a literature review, where the author examines previous studies in the field. The methodology section describes the research design, data collection, and analysis. The results section presents the findings of the study, and the conclusion summarizes the main points and offers suggestions for future research.

The second part of the paper discusses the importance of the study and the objectives of the research. It then proceeds to a literature review, where the author examines previous studies in the field. The methodology section describes the research design, data collection, and analysis. The results section presents the findings of the study, and the conclusion summarizes the main points and offers suggestions for future research.



the Tiger Creek tests. When this structure was first completed, Mr. Scobey selected five reaches of conduit from 3,000 to 5,000 feet long, with the greatest curvature in some and the least in others. Elevations were determined by careful levels on spots painted on the tops of both walls of the flume, every 25 feet on curves and 50 feet on straight sections. Precision piezometer gages, developed for such work, determined the damped-down water-surface position immediately below these spots.

To have rapid access to the spots, two light iron carriages were built to roll along the 5-inch top of the walls. These hung outside the flume, the weight being carried by a heavy ball-bearing rubber-tired wheel 10 inches in diameter, with two lighter wheels as outriders on the top of the flume. Other similar wheels gave a single contact inside the flume and two guiding contacts outside. The mechanical perfection of all these equipment was the work of E. J. Hoff of the Division of Irrigation. The carriages could be propelled by a small board as an oar, held in the current of the flume, but faster action was secured by aid of a man on the ground outside. With this equipment some 200 readings were made by two observers in  $2\frac{1}{2}$  hours, on a reach 4,000 feet long. These readings gave a detailed picture of the water line on both sides of the flume; while their average added to the velocity-head of the mean velocity, gave the energy gradient, measuring the friction loss in detail. While the observations were being taken, a current meter party took multiple-point readings at gaging stations and followed this method with integration readings. Additional details of results will be given in next month's News Letter.

W. W. McLaughlin left the Berkeley Office October 10 for a trip through Arizona, Texas, and New Mexico, thence to Denver, where he was to meet Mr. McCrory October 18.

A. T. Mitchelson made a short field trip to the Winters, Calif. area, covering parts of Napa, Solano, and Yolo counties, in order to study and report upon the feasibility of recharging the underground water supply by employing winter irrigation and the utilization of winter storm waters.

The Division of Irrigation will give at least ten radio talks over the N.B.C. system at San Francisco. The subjects cover a wide range and each will be appropriate to the season of the year. The second talk, prepared by L. M. Winsor, treats of winter irrigation. A. Lincoln Fellows gave a talk on "The Importance of Land Preparation for Irrigation."

One of the irrigation projects conducted in the Salt River Valley of Arizona this season has been a determination of the water requirements of the date palm. There are no data available in this country on the consumptive use of water by these plants.

W. W. McLaughlin, M. R. Lewis and Arch Work attended the Twenty-first annual session of the Oregon Reclamation Congress,





held at Medford, September 8 and 9. Informal talks were given by Messrs. McLaughlin and Lewis.

L. M. Winsor reports, in connection with his gravel and flood control project, that an extensive survey is being undertaken to determine in advance some of the principal localities where floods may be expected in various parts of Utah and what measures are necessary to provide reasonable protection or to prevent disaster. This work is being done by local government workers in irrigation and in forestry and by representatives of Utah State College, in cooperation with the flood committee of the newly reorganized State Land Board. Property owners in Davis County who were damaged by 1930 floods or who may be damaged in future unless protective measures are undertaken, are planning to erect flood protection works.

R. L. Parshall is conducting studies relative to the riffle sandtrap and a vortex sand separator which is believed to be practical in trapping the sand from mill tailings. He made observations at the Chain-of-Mines mill at Central City, Colo. and the model, consisting of a cylinder 30 inches high and 24 inches in diameter, was found to catch more than 75 per cent of the sand at the first separation. For a practical installation, it would be assumed that possibly two or three separations would be made in such a set-up. The sandy material in these tailings is of a fineness that would pass through a 40-mesh screen, and the slimes which were trapped as the overflow from the models are of almost colloidal material. A practical arrangement of such an installation would be to trap out the heavy and coarse material which would be turned into the creek and dispose of the slimes by means of pumping.

A. A. Young completed the Kootenai Valley, Idaho, investigation, which he has been carrying on under the supervision of L. T. Jessup since April. He reports that about 25,000 acres have been harvested in twelve drainage districts, about 8,000 acres having been in seed peas and about 14,000 in wheat. The season has been very dry and crop returns have been small. The investigation consisted of crop experiments in tanks in which the water levels were varied to agree with field conditions; studies of crop growth, crop yield, and soil moisture determinations; soil drainage experiments; alkali and specific gravity tests; and special studies of relation of crop growth and yield to depth to ground water. Mr. Young has returned to his permanent headquarters at Santa Ana, California.

R. B. Gray spent September 19 to 24 at the Washington office on matters pertaining to division activities. October 1 he was at Battle Creek, Michigan, assisting representatives of the office of motion pictures in taking movies of farm machines used by the pioneers which were shown in the pageant at the centennial





celebration October 5.

S. H. McCrory attended the two-day joint committee conference on the European corn borer investigations at Toledo September 30. At the experimental farm some 50 agricultural engineers, entomologists and others viewed the farm machinery demonstrations conducted by this Bureau.

R. M. Merrill returned to Toledo from South Norwalk, Conn. October 6, preparatory to taking charge of the corn borer control machinery investigations about November 1.

G. A. Cumings, S. P. Lyle and Frank Irons attended the North Atlantic Section of the A.S.A.E. at New Brunswick, N.J. on October 16. Mr. Cumings read a paper on "Conditions Influencing the Development of Fertilizer distributors."

S. W. McBirney and H. Mauer have tested their combination ensilage harvester and corn picker in the field with gratifying results.

R. B. Gray left Toledo October 8, for an extended trip in the south and west to visit the various farm machinery projects and to confer with the various machinery division engineers and cooperators. He visited the cotton ginning laboratory at Leland and accompanied Chas. A. Bennett to Jeanerette, Louisiana to confer with Messrs. Gordon and Hurst on the forage drying project, being carried on in cooperation between this Bureau, the Bureau of Plant Industry and the Bureau of Animal Industry.

John Randolph has been arranging and putting into effect, cooperative programs on cotton production with the Alabama and Mississippi stations, the cotton dusting machinery developments and tests for cotton boll weevil control having been closed for the present. David Isler will return to Presidio, Texas to resume the cooperative investigations with the Bureau of Entomology on pink boll worm control.

E. D. Gordon has tried out a crusher in connection with the drier at Jeanerette, La. and finds that the capacity of the drying plant for such material as soy bean hay, may be increased up to 50 per cent.

W. M. Hurst engaged in studies involving the artificial drying of rice, in cooperation with the Bureau of Agricultural Economics, has found that a high quality of rice may be obtained by artificial drying but that extreme care must be exercised to prevent rupture of the rice kernel by "sunchecking". A temperature of 120° F. seems to be the maximum which may be used without injury to the milling properties of the rice.

Geo. R. Boyd, assisted by J. G. Sutton, has made an investigation and prepared a report on the Green Bay Levee and Drainage District in Iowa, including recommendations for the financial rehabilitation of the district.





Mr. Boyd, assisted by G. R. Shier, is making surveys of a number of farms in Virginia with the view to recommending improvements intended to increase the yield per farm and reduce operating costs. Such improvements usually consist of removing stumps and rocks, clearing small tracts of timber, draining wet spots, and straightening or removing fences. Similar surveys have been made on farms in North Carolina, Georgia, and Minnesota during the past year.

S. P. Lyle visited extension engineers in Oklahoma, Texas, Louisiana, Mississippi and Illinois. He inspected the drying and ginning experiments in progress at Stoneville, Miss. and the hay drying experiments at Jeanerette, La. He also visited the erosion experiment farms at Temple and Tyler, Texas to obtain information which might be used in extension practice.

Mr. Lyle states that in the four Southern States he visited erosion control is the foremost extension activity. In Illinois it is becoming of increasing importance and more emphasis will be placed on it next year than in any previous year. The extension service both National and in all of the States are seeking solutions to the farming problems occasioned by the present economic situation. Because of this State extension engineers are giving attention to the timeliness of their recommendations relating especially to machinery problems.

Mr. Lyle attended the section meeting of the A.S.A.E. at New Brunswick, N.J. and discussed a paper on the "Correlation of Research in Extension Work."

J. T. Bowen will deliver lectures beginning February 2 before the graduate school of the Department on the subject "Regulation of temperature and humidity in incubators."

Wallace Ashby has prepared, for publication in "Agricultural Engineering" a brief article entitled "A method of comparing plow bottom shapes."

A. E. Edgar reports that the experiments with potatoes in storage at Presque Isle, Maine, are progressing satisfactorily. The experimental bins have been filled and observations are being made.

W. V. Hukill is making a second trip from the West Coast to New York with a shipment of fruits and vegetables for the purpose of observing the effects of different colors of paint on the absorption of heat by refrigerator cars.

A. H. Senner is preparing for publication in "Agricultural Engineering," a paper on "Greenhouse plant growth stimulation by means of artificial lights."

